

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/01744

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E21B7/26 E21B7/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/000332 A1 (CAMP DAVID ET AL) 3 January 2002 (2002-01-03) paragraph '0019!	1, 9, 10
Y	paragraph '0028! - paragraph '0031!	3-8, 14, 15, 20
A	paragraph '0042! - paragraph '0043! paragraph '0060!; claim 26; figures 1, 2	16, 18, 20
X	US 4 856 600 A (CHAU ALBERT W ET AL) 15 August 1989 (1989-08-15) column 1, line 61 - line 65 column 2, line 17 - line 26	1
A	column 4, line 38 - line 42; figure 1	16
X	US 4 955 439 A (KINNAN FRANK R) 11 September 1990 (1990-09-11)	16, 18
Y	column 6, line 36 - line 47; claim 1	3-5, 19-21, 23
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
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- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

8 September 2003

Date of mailing of the international search report

15/09/2003

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 395 167 A (SMET NIK) 31 October 1990 (1990-10-31)	16
A	column 4, line 19 - line 39; claims 1,2; figure 1	3-5, 19-23
Y	US 5 850 884 A (LITTLEJOHN GAVIN STUART ET AL) 22 December 1998 (1998-12-22) claim 3; figure 1	6
Y	US 4 646 277 A (BRIDGES JACK E ET AL) 24 February 1987 (1987-02-24) column 2, line 4 - line 16; figure 1	7,8
Y	WO 00 46484 A (SHELL CANADA LTD ;SHELL INT RESEARCH (NL)) 10 August 2000 (2000-08-10) page 2, line 26 - line 32	14,15,21
Y	US 3 818 996 A (MCCALEB S) 25 June 1974 (1974-06-25) abstract	19
A	WO 91 11646 A (JOHNSON HOWARD E) 8 August 1991 (1991-08-08) figure 1	1,16
A	EP 0 806 543 A (GEISERT ENGINEERING GMBH) 12 November 1997 (1997-11-12) figures 1,4	2,16,17
A	US 5 322 391 A (FISK ALLAN T) 21 June 1994 (1994-06-21) figures 4,5	9
Y	US 2001/023614 A1 (TUBEL PAULO ET AL) 27 September 2001 (2001-09-27) paragraph '0013!	23
A	paragraph '0015!	4
A	US 5 303 202 A (CARROLL PAUL E ET AL) 12 April 1994 (1994-04-12) abstract	23

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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-10,16-18,20,23

Steerable soil penetration system comprising an elongated flexible tubing having an outer diameter larger than 80% of the width of the penetration head.

(As the subject-matter of claim 1 is not new, for example in the light of US 2002/0000332, the features of claim 2 have been taken as the "special technical feature" of the first group of inventions)

2. Claims: 11,12

Steerable soil penetration system comprising a bendable tubular steering section activated by heating or cooling specific elements of the steering section

3. Claim : 13

Steerable soil penetration system comprising a bendable tubular steering section with a weakened side, and a movable sleeve to be selectively shifted over the weakened section

4. Claims: 14,15,21,22

Steerable soil penetration system comprising an elongated flexible tubing which can be expanded in situ after insertion in the ground

5. Claim : 19

Method of of piercing a hole in a subsurface formation comprising the step of applying a voltage between tubing and formation so as to polarize the clay particles.

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Information on patent family members

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